BAYOU CHAUVIN TMDL FOR NOXIOUS AQUATIC PLANTS

SUBSEGMENT 080102

US EPA Region 6

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EXECUTIVE SUMMARY

Section 303(d) of the Federal Clean Water Act requires states to identify waterbodies that are not meeting water quality standards and to establish total maximum daily loads for those waterbodies. A total maximum daily load (TMDL) is the amount of a pollutant that a waterbody can assimilate without exceeding the established water quality standard for that pollutant. Through a TMDL, pollutant loads can be distributed or allocated to point sources and nonpoint sources discharging to the waterbody. This TMDL addresses impairment of Bayou Chauvin caused by noxious aquatic plants.

Bayou Chauvin, Subsegment 080102, was listed for noxious aquatic plants on the October 28, 1999 Court Ordered §303(d) list as not fully supporting the water quality standards for propagation of fish and wildlife, and was ranked as high priority for TMDL development. Bayou Chauvin was listed for noxious aquatic plants by virtue of its listing in the State of Louisiana's 1993 Nonpoint Source (NPS) Report.

EPA interprets Section 303(d) to require that TMDLs must be established where a waterbody is impaired or threatened by a "pollutant." EPA considers the noxious aquatic plant growth in Bayou Chauvin to be a "pollutant" within the meaning of Section 502(6) of the Clean Water Act. Today's action does not represent a determination by the Agency that section 303(d) listings for such impairments as "noxious aquatic plants," "invasive species" or "exotic species" are in all cases "pollutants" within the meaning of Section 502(6) of the Clean Water Act. In 1978, EPA decided that all pollutants, under proper technical conditions, are suitable for the calculation of TMDLs (43 Fed. Reg. 60662, December 28, 1978). EPA may reevaluate whether materials such as "noxious aquatic plants" are pollutants, generally or in individual situations, for Clean Water Act purposes.

A load allocation of zero and a wasteload allocation of zero for noxious aquatic plants (native and invasive) are established in this TMDL. Invasive species have an extremely high rate of plant growth, and therefore need to be controlled to zero levels to avoid re-introduction and re-growth. Natural and anthropogenic nutrient enrichment may contribute to noxious aquatic plant growth in Bayou Chauvin. Nutrients have been addressed in a separate document, Bayou Chauvin Watershed TMDL for Biochemical Oxygen-Demanding Substances and Nutrients (LDEQ, 2001). Additional control methods may be needed to control plant growth to the level needed to meet the designated use of fish and wildlife propagation.

1.0 Introduction

Bayou Chauvin, Subsegment 080102, was on the October 28, 1999 Court Ordered §303(d) list as not fully supporting water quality standards for propagation of fish and wildlife, listed for noxious aquatic plants and was ranked as high priority for TMDL development. The cause of impairment for Bayou Chauvin was listed as noxious aquatic plants by virtue of its listing in the State of Louisiana's 1993 Nonpoint Source (NPS) Report.

Bayou Chauvin has been assessed as a waterbody impaired by noxious aquatic plants. Section 303(d) of the Clean Water Act requires the identification, listing, ranking and development of TMDLs for waters that do not meet applicable water quality standards after implementation of technology-based controls. The purpose of a TMDL is to determine the pollutant loading that a waterbody can assimilate without exceeding the water quality standard for that pollutant; the TMDL also establishes the load reduction that is necessary to meet the standard in a waterbody. This TMDL includes a wasteload allocation (WLA), a load allocation (LA), and a margin of safety (MOS). The wasteload allocation is the portion of the load capacity allocated to point sources for the pollutant of concern, and the load allocation is the portion of the load capacity allocated to nonpoint sources and/or to natural background. The margin of safety is a percentage of the TMDL that accounts for the uncertainty associated with the model assumptions and data limitations.

2.0 Study Area Description

The Ouachita River's source is found in the Ouachita Mountains of west central Arkansas near the Oklahoma border. The Ouachita River flows south through northeastern Louisiana and joins with the Tensas River to form the Black River, which empties into the Red River. The Ouachita Basin covers over 10,000 square miles of drainage area. Most of the basin consists of rich, alluvial plains cultivated in cotton and soybeans. The northwest corner of the basin is forested in pine, which is commercially harvested. (LDEQ, 1996).

2.1 Bayou Chauvin, Subsegment 080102

A map showing land use may be found in Appendix A (LDEQ, 2001). The Bayou Chauvin watershed comprises the lower portion of Subsegment 080102. The upper portion of the subsegment is made up of the Lonewa Bayou and River Styx watersheds. This TMDL is limited to the Bayou Chauvin watershed.

Bayou Chauvin originally drained Chauvin Swamp to the Ouachita River. Ouachita River overflow often flooded this area prior to completion of the east bank Ouachita River Levee in 1937. The levee includes floodgates in the natural drains of Bayou Chauvin, River Styx, and Lonewa Bayou. In the early 1950's the Louisiana Department of Public Works constructed the L-11 Canal cutting through the natural banks of Bayou DeSiard to provide Chauvin Swamp an outlet to Little Bayou Boeuf thence to Bayou LaFourche. The watercourse that is herein referred to as Bayou Chauvin originates in a pooled reach of L-11 Canal just west of the junction of Caney Creek and east of Highway 139 and, at moderate to low flow conditions, flows in a westerly direction through Chauvin Swamp to the Ouachita River. The portion of Bayou

Chauvin above Highway 165 has been channelized. West of Highway 165, Bayou Chauvin flows through a natural streambed to the Ouachita River Levee.

Bayou Chauvin cuts across the Bayou Desiard watershed just east of Joe White Road. Bayou Desiard is conveyed from the north to the south side of Bayou Chauvin by a siphon under Chauvin. Much of the flow in Bayou Chauvin comes from two Bayou Desiard overflow weirs located near either end of the siphon. Under low flow conditions, leakage through the timber weirs and sewage treatment facility discharges provide the flow in Bayou Chauvin. Headwater flow from the pooled reach at the junction of Caney Creek, although present, is minimal. There is another overflow weir on Bayou Desiard at Hogg Bayou swamp that conveys some additional flow to Bayou Chauvin via the swamp. There is one very small intermittent tributary that joins Chauvin Bayou from the north just west of the Missouri Pacific Railroad.

Land uses in the Bayou Chauvin watershed are wetland, agriculture, forest, and suburban development. The suburban development is, in many areas, not dense enough to show up and is recorded in the land use mapping as grassland and wetland. Most of the Bayou Desiard waterfront is suburban. There is also an area near the Ouachita River Levee and below Bayou Chauvin that is suburban and not wetland.

Table 1. Land Uses in the Bayou Chauvin watershed

LAND USE	ACRES	PERCENT
Agricultural and grassland	3500	43%
Wetland	3200	40%
Forest land	500	6%
Suburban	500	6%
Water	400	5%
Total	8100	100%

2.2 Water Quality Standards, Uses, and Support Issues

The Water Quality criteria, designated uses, and support of uses for the 080102 watershed are shown in Table 2. In addition, the LDEQ Water Quality general standards at §1113.B.1.e provides that all waters be free from such concentrations of substances attributable to wastewater or other discharges sufficient to produce undesirable or nuisance aquatic life. These general and numeric standards are established to promote restoration, maintenance and protection of state waters. Due to typical storage of nutrients in lake sediment, and the very fast rate of growth of native and invasive noxious aquatic plants, reducing nutrient loadings by themselves is not expected to reduce nuisance aquatic plant growth to a level necessary to meet this standard and restore the designated use of fish and wildlife propagation (see discussion in Section 2.3). Therefore, in addition to the nutrient loadings being established, a level of nuisance aquatic plant loading is established to meet this narrative water quality criterion.

Table 2. Water Quality Numerical Criteria and Designated Uses

Subsegment	080102
Stream Description	Bayou Chauvin – headwaters to the Ouachita River
Designated Uses	A B C
Support of uses	Not supporting uses due to violations of dissolved oxygen and bacteria criteria
Criteria:	
Cl	160 mg/l
SO_4	35 mg/l
DO	5.0 mg/l
pH	6.0 – 8.5
BAC	1
TEMP	33 ^oC
TDS	350 mg/l

USES: A – primary contact recreation; B – secondary contact recreation; C – propagation of fish and wildlife; D – drinking water supply; E – oyster propagation; F – agriculture; G – outstanding natural resource water; L – limited aquatic life and wildlife use.

2.3 Noxious Aquatic Plants

Table 3 summarizes both native and invasive noxious aquatic plants that Louisiana Department of Wildlife and Fisheries (LDWF) has identified as contributing to impairment of the fish and wildlife propagation water quality standard in warm water Bayous and lakes of Louisiana. These include submersed, floating and immersed species of plants. Natural and anthropogenic nutrient enrichment may contribute to noxious aquatic plant growth in Bayou Chauvin. However, invasion by aquatic species is not always a result of increased nutrient loading. This TMDL does recognize that loading reductions of nitrogen/ammonia as called for in the Bayou Chauvin TMDL for oxygen demanding may lead to reduced plant growth and infestation, and thereby contribute to reaching the goal of attaining the dissolved oxygen standard.

Table 3. Exotic invasive and dominant native aquatic plant species

Exotic invasive species	Dominant native species
hydrilla (*Hydrilla verticillata*)	coontail (*Ceratophyllum demersum*)
milfoil (*Myriophyllum heterophyllum)*	fanwort (*Cabomba caroliniana*)
water hyacinth (*Eichhornia crassipes)*	southern water grass (*Hydrochloa caroliniensis*)
salvinia (*Salvinia minima*)	duckweed (*Lemna minor*)
alligator weed (*Alteranthera philoxeroides)*	watershield (*Brasenia schreberi*)
	American lotus (*Nelumbo lutea*)

Source: LDWF, Personal Communication, 2000.

There is a complex relationship between nutrient loading and macrophyte growth in lakes. In algal or non-rooted macrophyte dominated systems, nutrient reduction in the water column can be expected to show a positive effect, usually resulting in a direct reduction of noxious aquatic plant growth to meet water quality standards. However, for waters where rooted macrophytes dominate, or where fast-growing invasive aquatic species exist, as is the case in Bayou Chauvin, the situation is more complex. In the first case, the rooted macrophytes may derive much of their needed nutrients from nutrient laden sediments. In such cases the response of the rooted macrophytes to water column reductions of nutrients will be slower than that of non-rooted macrophytes that rely on the water column for their nutrients. Consequently, controlling nutrient loadings may not be adequate to reduce noxious aquatic plant growth. As a result, additional in-lake management measures may be required to achieve reductions in plant biomass to meet water quality standards.

In the second case, where invasive plant species are present, their extremely high rate of growth and reproduction in the waterbody can lead to significant proliferation and water quality impairment, even in the absence or control of nutrient enrichment. In addition, invasive species may also be brought in from other waterbodies, usually by watercraft, and establish new populations of nuisance aquatic species, thereby contributing to non-attainment of the designated uses. It is likely that additional control methods may be needed to reduce noxious aquatic plant growth necessary to meet the water quality standards. These may include plant harvesting, application of herbicides, active drawdown, and other near-lake controls to prevent re-establishment of noxious plant populations from outside sources.

3.0 Loading Capacity and TMDL Formulation

3.1 Noxious Aquatic Plants

The loading capacity for noxious aquatic plants is zero. Invasive species have an extremely high rate of plant growth, therefore exotic noxious aquatic plant biomass should be controlled to zero levels to avoid reintroduction and regrowth.

3.2 Wasteload Allocations

The wasteload allocation for noxious aquatic plants is zero. No point sources of noxious aquatic plants are known to exist.

3.3 Seasonal Variation

Critical conditions for growth of aquatic plants is summer when water temperatures and available solar radiation is greatest. Because the WLA and LA for this TMDL are zero no additional consideration of seasonal variation was made.

3.4 Margin of Safety

Due to the conservative nature of this TMDL no explicit margin of safety was established.

4.0 Reasonable Assurance and Other Relevant Information

Reduction of nutrient loadings may not be entirely adequate to control plant growth necessary to meet the water quality standards. Additional management methods may include plant harvesting, application of herbicides, active drawdown, and other near-lake controls to prevent re-establishment of noxious plant populations from outside sources. The LDWF has established a statewide program to manage problem aquatic vegetation. The Louisiana management philosophy is based on the belief that eradication of these problem species on a large scale is not feasible. The management philosophy and goal of the aquatic plant program for Louisiana is maintenance and control. This is defined as "the strategy of keeping nuisance aquatic plants at their lowest feasible levels by a constant program of search and destroy of infestations." A number of alternatives have been explored in an effort to develop the most efficient, safe, and economical program for controlling nuisance aquatic plants in Louisiana. Consistent with the need to safeguard the environment, combinations of herbicide control (utilizing EPA approved herbicides), water level fluctuations and approved biological agents are the most efficient, economical and practical measures presently available for the aquatic plant management and control in Louisiana. (LDWF, Personal Communication, 2000). Herbicide application has been used for the past three or four years to control hydrilla.

As part of the State of Louisiana's strategy to control the growth and spread of invasive aquatic plants, the LDWF has the following regulation concerning noxious aquatic plants in their recreational fishery regulations:

Noxious Aquatic Plants – Importation Prohibited

No person shall, at any time, knowingly import or cause to be transported into the jurisdiction of the state of Louisiana from any other state or country, without first obtaining a written permit from the Commission, any of the following noxious aquatic plants which are or can be grown submerged or partly submerged, or floating in water. Eichhornia azurea (rooting or anchoring hyacinth), Elodea Canadensis (elodea), Hydrilla spp. (hydrilla), Lagarosiphon muscoides & Lagarosiphon major (African elodea), Myriophyllum spicatum (Eurasian watermilfoil), Najas marina (marine naiad), Najas minor (slender naiad), Panicum repens (torpedograss), Pontederia spp. (pickerelweed), Spirodela oligorrhiza (giant duckweed), Trapa (waterchestnut), Melaleuca quinquenvia (kapok tree), Pistia stratioties (water lettuce), Salvinia spp. (salvinia), Lythrum salicaria (purple loosestrife), Eichhornia crassipes (water hyacinth).

This ban on the importation of noxious aquatic species from other states or countries to fresh waters of Louisiana should help to control the growth and proliferation of noxious aquatic plants in Bayou Chauvin in order to meet the zero loading specified in the TMDL.

5.0 Public Participation

When EPA establishes a TMDL, 40 C.F.R. § 130.7(d)(2) requires EPA to publicly notice and seek comments concerning the TMDL. EPA prepared this TMDL pursuant to the consent decree, Sierra Club, et al. v. Clifford et al., No. 96-0527, (E.D. La.) signed and entered on April 1, 2002. Federal regulation requires that public notice be provided through the Federal Register and through newspapers in the local area. The Federal Register notice was issued on March 29, 2002 (Volume 67, Number 61, pages 15196 – 15198). This TMDL was also noticed in local newspapers including The News Star and New Orleans Times-Picayune. No comments or additional information were submitted during the 30-day public comment period for this TMDL. The EPA will provide notice that this TMDL has been made final to the Louisiana Department of Environmental Quality (LDEQ) along with a request that it be incorporated into LDEQ's current water quality management plan.

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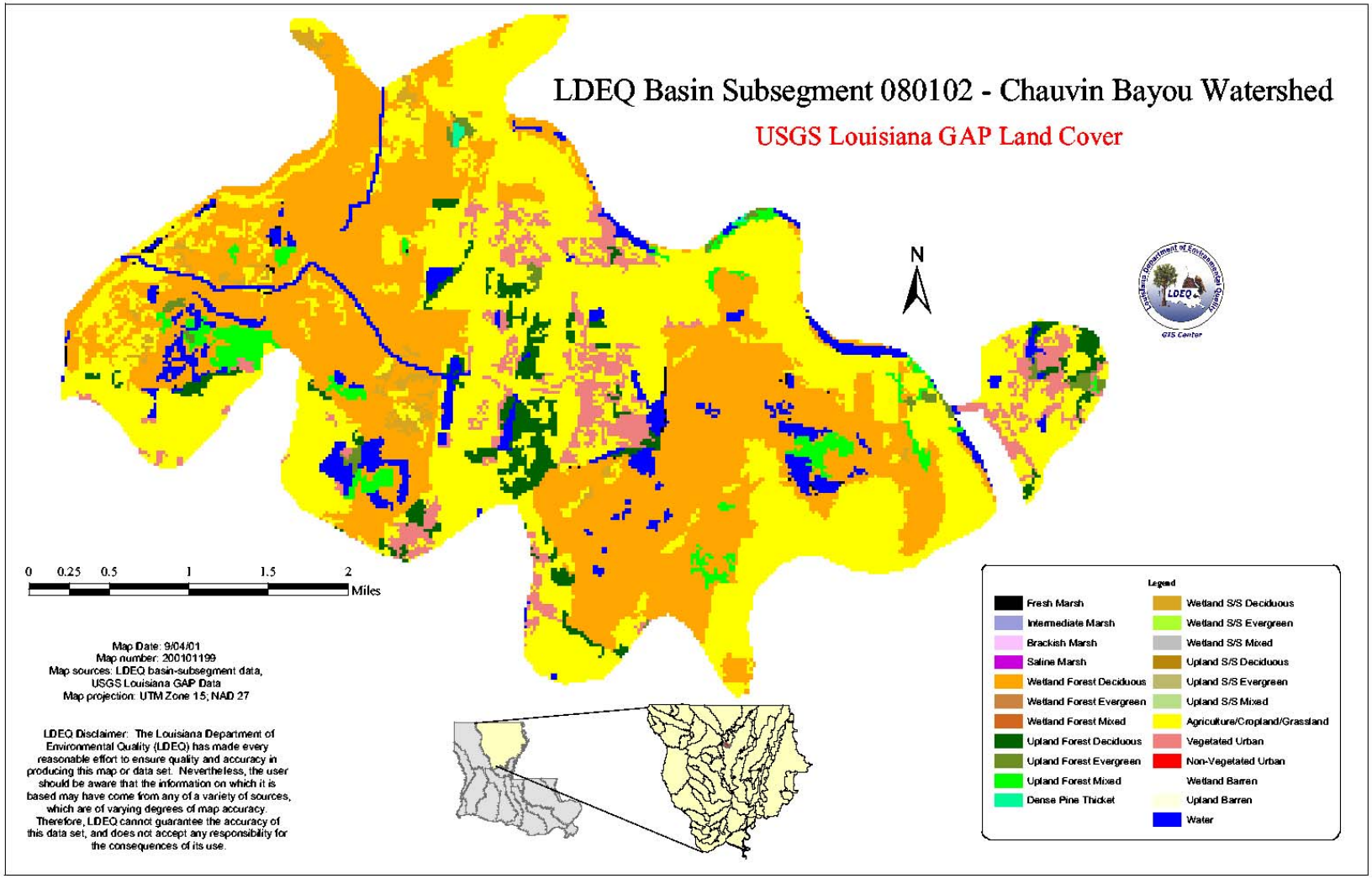

APPENDIX A. Land Use Map